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HOW TO LIVE

ADELINE KNAPP



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HOW TO LIVE

A MANUAL OF HYGIENE

*FOR USE IN THE SCHOOLS OF THE
PHILIPPINE ISLANDS*

BY

ADELINE KNAPP

AUTHOR OF "THE STORY OF THE PHILIPPINES"

ILLUSTRATED

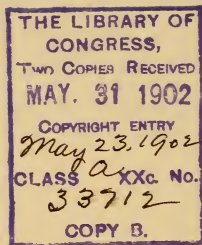


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HOW TO LIVE.

CHAPTER I.

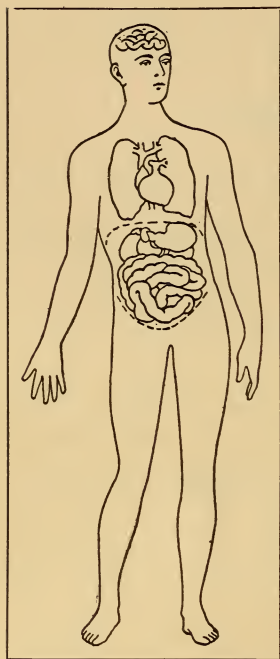
THE HUMAN BODY.

N America, where they make the best locomotive engines in the world, they say that the life of an engine is about twenty years. That is, when they build an engine, they know about how much work it will have to do and what usage it is likely to have. They know that the engine is strong enough to do such work and stand such usage for twenty years. So they say that the length of the engine's life is twenty years.

Now, a man's body is, in its way, a machine. It is made to do certain work, and if it has the right sort of care, it ought to be healthy and do the work required of it, to the end of the man's life.

It is estimated that the natural life of a man is seventy years. This little book is intended to tell us how to live and something about caring for our bodies so that

they shall last as long as possible, and be ready and able to do their work in the world.



THE SKULL, CHEST, AND
ABDOMEN.

In a general way, we may compare the human body to three closed boxes, one above another. These boxes are the skull, the chest, and the abdomen. Each one has its own special contents, formed to do a special work for the body. The skull is a hard, bony case made to contain the brain. This is where

the mind lives, and it is part of the work of the mind to take care of the body and direct its movements. The brain maintains a sort of telegraph station within

itself. Wires, which we call nerves, branch out from it to all parts of the body, and the brain is constantly receiving messages over these wires and sending others telling the muscles what to do. For instance, if the hand comes in contact with something hot, a message instantly goes to the brain, telling this fact. The brain sends back word to take the hand away, and the hand is withdrawn. But all this is done so quickly that the hand seems to be withdrawn the very instant that it comes in contact with the fire. The skull is supported by the backbone, which connects it with the second closed box.

This second cavity is the chest, which is really a sort of cage formed by the ribs, the backbone, and the breastbone. In the chest are the heart and the lungs. The heart is an engine. Put your hand over it and you can feel the steady throb of its beat, day and night. It is working all the time, whether you are awake or asleep. The business of the heart is to send blood to all

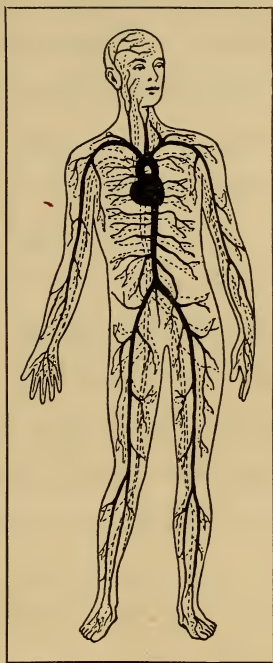
parts of the body. It does this by driving the blood through tubes, called arteries and veins, that go all over the body. The arteries are deep down among the muscles, but some of the veins are close to the surface. We can see blue veins at the temples and on the backs of our hands. All the blood goes to every part of the body once in two minutes.

The food which a person eats is acted upon by the digestive fluids in the body and is turned over and dissolved until it becomes fluid itself. It is then taken up by the blood and carried to different parts of the body, so that each organ and muscle gets what it needs. We shall learn, a little later, just how the food gets into the blood. We have seen that the heart sends the blood out through vessels, which are called arteries. This blood starts from the heart bright red, full of fresh air and food for the body. As it goes on its journey, each tissue takes from it what is needed to keep that part healthy, and at last the blood has

given out all the good things with which it was loaded. It no longer carries food and fresh air, but is full of the impurities taken in on its journey. If something were not done to cleanse it, the man would die.

The impure blood flows from the arteries into the veins through tiny canals. The veins are tubes something like the arteries, and they usually lie beside the arteries. They and the arteries are like the two tracks of a great railway line, one going from the main station, the heart, the other coming back.

But the blood in the veins is not like that in the arteries. Instead of being bright red, and healthy-looking, it is dark colored. It flows more slowly, and it is full of impurities



THE CIRCULATION OF THE BLOOD.

The blood is forced by the heart through the arteries (black lines), and returns to it through the veins (dotted lines).

which it is carrying away from the body. The veins carry this blood to the right side of the heart, and the heart sends it to the lungs. There are many blood vessels in the lungs, and they are divided into branches running in every direction through the lung tissue. When we draw in a deep breath, we fill the lungs with fresh air. This is at once taken up by the impure blood in the branching blood vessels. The impurities are breathed out with the air that leaves our lungs, and the blood once more becomes bright red and full of new life. In this way the blood is purified. Then it is sent back to the heart, all ready to start out again through the body. The whole journey is made every two minutes.

The third box, which we call the abdominal cavity, is separated from the chest by a broad, thin muscle, the diaphragm. The abdomen has a hard floor of bone, but the walls are soft, being made up only of the muscles and the lower ribs. In the abdomen are the stomach and intestines, the liver,

kidneys, and other organs of which we shall learn later.

Food is carried from the mouth to the stomach by the muscular tube which passes through the chest just back of the breast-bone. This tube is called the esophagus. With the mouth, the stomach, and the bowels, it forms what is called the food canal.

As soon as the food enters the mouth, it begins to turn from solid into liquid form, so that the blood can take it up. We chew the food, so that it may become mixed with the saliva in the mouth; then it is swallowed and goes into the stomach. This is a kind of sack which holds about a quart. Just as saliva is secreted in the mouth and acts upon the food, so in the stomach there is a fluid called the gastric juice, which aids digestion. The gastric juice mixes with the food, dissolves it, and makes it soft, so that it can pass through the lower opening of the stomach into the intestines. Here there are other juices which dissolve still more of the food, until at last it is all liquid and looks like milk.

Now it is taken up by the blood through tiny canals that reach down into the intestines and absorb it. But it is not really a part of the blood yet. It must be changed still further, so the blood carries it to the liver. Here it is made a part of the blood, and is able to nourish all parts of the body.

All the food that cannot be dissolved is indigestible, and the body must get rid of it. Some of it passes off as solid matter, by way of the bowels; some is got rid of through the urine; some goes out with the breath, as we have seen; and a great deal goes off in the perspiration. This is why we need to bathe our bodies and to wash our clothing. The perspiration brings the bad matter to the surface, where it clings to the skin and the clothing until it is removed by washing.

But this series of boxes, which we call the head and trunk of the body, would be very helpless without the legs and arms to carry them about and to wait upon them. Taken all together, the head, trunk, and limbs form the body. The framework, which we call

the skeleton, is made up of bones. These bones are like the framework of a house,—they keep the body upright and support the muscles. In young people the bones are soft and elastic. A baby often has falls that would break the bones of a grown person, but the baby's bones are not broken because they are not yet hardened. This is an advantage, for children get a great many more falls than grown people do, and it would be hard for them if the bones were broken as easily.

But if children's bones do not break, they bend, and it is easy for them to grow into bad shape. If children do not sit up straight they become round-shouldered, and many children get into the habit of carrying one shoulder higher than the other. Often, too, they are careless about walking and sitting properly.

In this country, where nearly all weights are carried on the head, we rarely see a man who does not carry his head and shoulders well. He learns in childhood to keep his

shoulders even and to hold his head up. But there is one custom of the country which prevents the people from walking well. This is the practice of carrying little children on



THE WRONG WAY TO CARRY A BABY.

the hip. It is bad for the children, as it strains the muscles of the lower part of the back, and bends the soft little bones so that they do not grow straight as they naturally would. It is bad, too, for the person who carries the child.

The body is thrown to one side, the weight of the child presses the soft organs of the abdomen downward, and the effect is often serious. It is very bad indeed for one child to carry another this way. Babies should be carried in the arms, as European children are.

When we walk, we should let the weight of the body rest on the soles of the feet. We should lift the foot free from the ground and carry it straight forward when we step. Some day, if you will study the difference between the walk of a good horse and that of a carabao, you will see how a man should walk. The horse lifts his hind foot, carries it straight forward, and sets it down almost exactly in the print his front foot made. The carabao lifts his hind foot, swings it outward in an awkward curve, brings it back into line, and sets it down in much the same way as the horse. But he loses a little time swinging it outward, and he looks very clumsy, as well.

Now, some people, instead of walking like horses, walk like carabaos. They scuffle along the street with dragging steps, rolling their hips, and swinging their feet outward, just as these animals do. They look lazy and clumsy, and as if they could hardly hold their bodies together. People should learn to walk well while they are young.

The bones are covered with muscles, which are what we mean when we say the *flesh*. There are a great many muscles in the body. They give it shape and move it about. When we bend an arm or a finger, we do it by the action of the muscles. The brain tells the muscles how to act, as we have seen. It sends messages along the nerves, and the muscles obey. We can make our muscles strong by exercise, but if we do not use them enough, they will grow weak and soft.

QUESTIONS.

How does the brain send messages to the different parts of the body?

What does the heart do?

What does the blood take up from the body?

How does it get rid of impurities?

What becomes of food after it is swallowed?

How are the bones of a child different from those of a grown person?

How does it hurt the bones to sit or stand badly?

Why should we sit up straight?

How ought babies to be carried?

Why is it hurtful to carry them on the hip?

What do we call the muscles?

What are their uses?

How can we make our muscles strong?

CHAPTER II.

THE STORY OF WATER.



GOVERNOR-GENERAL CARRIEDO
Who gave Manila her waterworks.



ANY years ago there was a wise governor-general in the Philippine Islands, who left a large sum of money to the city of Manila. This money was to be put out at interest and allowed to increase, and in his will the governor-general directed that when there should be a large enough sum, it should

be used to build waterworks for the city of Manila.

The waterworks were not built until a hundred years after the governor-general died. In 1872 another wise governor-gen-



PUMPING STATION, MANILA WATERWORKS.

eral came to the islands, and learning of this money which had been left, he at once set to work to provide the city with a water supply. This was one of the best things that ever happened to Manila. In the trop-

ics nothing is more important than pure water.

There is a great deal of water in the body. In fact, three fourths of the body is made up of water. It is in the blood, in the muscles, and in the bones. There is even some water in the enamel of the teeth, which is the hardest substance in the whole body. The digestive juices, the saliva, and the different intestinal juices, all help to dissolve some part of the food which we take. To obtain this power to dissolve the food, they depend upon water.

When a man is thirsty, it seems to him that his throat is dry. But dryness of the throat is only a sign by which the body makes known its need. Thirst is the cry of the fluids and tissues for water. It means that some part of the body is suffering for the precious fluid.

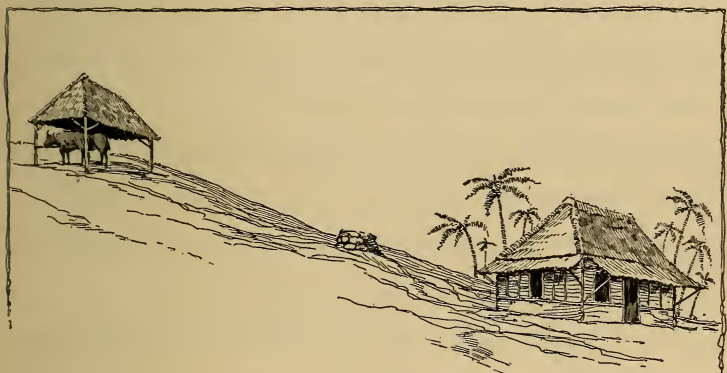
If we look at a drop of water under a microscope, which magnifies it many times, we shall see in the water a great number of moving specks which are really little animals.

The animals are so small that thousands of them can live in a single drop of water as happily as they could in a whole ocean of room. They are called germs. Some of them are wholesome: they help to keep the water bright and sparkling and sweet, and make it pleasant to the taste. But some of them are very harmful: they produce many kinds of disease, most of which cause death.

It is because of these germs that people, particularly in tropical countries, have to be so careful about the water they drink. The purest water that we have is clean rain water. This is the vapor which rises from the earth and from the surface of the sea. It ascends into the air until it strikes a current of cold air, when it is turned into moisture and falls as rain.

We can catch the rain water in cisterns or other vessels; and this water we may drink without boiling, if we are careful to keep the cisterns clean. The cistern, to be perfectly sweet, should be emptied and cleaned at least once every two weeks.

In this country nearly all the drinking water comes from wells. Well water may be very good, but the chances are that it is full of impurities. The water from the wells is rain water which has soaked into the earth and has collected in the well. But the



THE WRONG PLACE FOR A WELL.

earth is always full of impurities. It is like a great sponge through which the water flows, and the water is pretty sure to take up some impurities as it sinks through the earth.

If a well is near an outhouse or stable, or a place where cattle are kept, the water that filters through this earth will carry with it germs from these places. A well should

always be on higher ground than any out-buildings. It should be some distance from the house, and no slops or anything emptied from the house should be put near it. No drainage of any kind should run near it.

In the city of Pittsburg, in the United States, some years ago, there was an epidemic of typhoid fever. Many thousands of people died, and at last the legislature of Pennsylvania appointed a committee to investigate the cause of the epidemic. This committee began to study the source of the city water supply. They traced it far up the mountains, many miles away, until they found a certain little stream emptying into a large river which supplied the city. Living on the banks of this stream was a family where there was a case of typhoid fever. The slops from the house had been thrown into the stream and had so poisoned the water that thousands of people in far-away Pittsburg died of typhoid fever.

In Manila there was once a great cholera epidemic, during which more than thirty

thousand Filipinos in the city and province of Manila died; many Spanish people died also. During the worst of the epidemic the death rate was at least a thousand every day. But only one Englishman died, and it is said that his death was due to his own carelessness in drinking impure water.

If everybody in the city had boiled and filtered the drinking water, as the Americans and the English did, nearly all of these thirty thousand people would have escaped death.

What has been said of the impurities collected by water passing through the earth is especially true of the water which supplies Manila. The ground all about the city has been so long occupied by large numbers of people, the drainage has been so poor and so many impurities have been cast out, that the soil for a great distance around the city is a mass of decay. To stir up the earth, as when digging and laying pipes, makes the men who do it feverish and often ill, because of the gases rising from the soil. We may judge from this how bad the water must be

that drains through the earth and is collected in the wells of the city. Even the water in the Carriedo water pipes cannot be said to be pure. It comes from a river far from the city. On the banks of this river are many native villages, and the people throw all sorts of refuse into the stream. They wash their clothes in it, and bathe themselves, their horses, and their carabaos there. For this reason the water should be purified before we drink it.

When the Americans first came to Manila the city was not kept as clean as it is now. This is one reason why there were so many deaths in Manila, and because of the high death rate, the Americans at once set to work to clean the city. To do this cost the lives of many American soldiers, who died of fever caused by bad gases from the earth; but since it was done, the death rate in Manila is less than it ever was before.

But even yet the death rate is greater than it would be, if everybody would be careful about food and drink. The

greater number of those who die are little children. Indeed, one third of all the deaths in Manila are of children who die of a single complaint. This is the terrible fits from which we so often see little babies suffering. The fits are caused by trouble in the stomach and bowels, arising from bad food and drink. Sometimes the little one dies because it is worn out by the pain it has suffered. Sometimes the brain is affected by the stomach trouble; but the true cause of death in every such case is impure water or the wrong kind of food. Most of the trouble comes from the water which the children drink.

Not even a grown person ought to drink water that has not been boiled. It is not safe, for the germs of many of the tropical diseases are found in the water. All of these germs are killed by that degree of heat which we call the boiling point. No less heat than this will kill them.

It is not enough merely to heat the water; it must really boil for at least five minutes after it begins to bubble and simmer. It

ought then to be strained through a clean cloth and put at once into a banga or some other of the jars used to contain water. The jar should be clean, and should have a cover. If it is hung in a draft of air, the water will become cool enough to drink.

The jars used to hold water should be of ware that will "sweat" after the liquid has been in them for some time. That is, the outside should be covered with beads of moisture which have crept through the sides. This sort of jar keeps the water cool and lets the air get to it. Water, after it has been boiled, is tasteless and flat, and until it again takes up oxygen from the air, it is not so pleasant to drink, or so digestible as it was before boiling.

We have seen how important water is to life, and we cannot have too high an idea of the importance of its being pure. It is not enough that water looks clear and sparkling. It may look like crystal and yet be full of poisonous germs. The only way to be certain that it is pure is to boil it and then see

that no further impurities get into it before it is used.

QUESTIONS.

What is thirst?

What is the proportion of water in the body?

What is the purest sort of water we have?

How does water become unfit for drinking?

How may it be purified and made fit to drink?

How should drinking water be kept?

CHAPTER III.

ABOUT FOOD.



HALL we go to market to-day? Let us go to one of the large new buildings that the government has put up in Manila, to be used as markets. They are well fitted for this purpose. They have cement floors, which can be washed every day, and clean, well-built stalls, where goods are sold. The floor of a market should be washed often, and every bit of waste matter should be carried off. If this is not done faithfully, the food sold there spoils and becomes unfit for use.

What quantities of fruit! It would take a long time to count all these bunches of bananas. The mangoes are in season now, and look very tempting. It is not well to eat too many of them at the beginning of

the season, however, and we should be sure that those which we do eat are ripe and



A BADLY ARRANGED MARKET.

sound. Unripe fruit is very hurtful, and so is fruit which is too ripe, which has begun to decay. Some of these bananas, for in-

stance, are so black and so soft that no one should think of trying to eat them. In some countries a merchant who tried to sell such fruit would soon find himself stopped from selling any fruit at all. The law would not allow him to offer poison for sale, and decayed fruit is poison.

We will buy some of these sound, clean-looking bananas, and a few oranges this morning. We will choose oranges that are of a fine, rich green, not too hard, but firm and of good weight. Oranges that feel light in the hand are dry and not wholesome.

Here are radishes and lettuce, for salad ; but if we buy these, we must be sure that they are well washed in boiled water before we eat them. There are little creatures, so small that they cannot be seen without a strong microscope, that live among the lettuce and other green leaves. These tiny creatures are the cause of the worst form of dysentery. All sorts of vegetables which we eat raw should be washed clean, and it is of no use to wash them in unboiled water,

as the amœba (which is the little creature's name) may be in that, too.

We need camotes to-day, and here are some fine ones. We will not buy them, however. Why? Do you not see that some one has been chewing betel-nut, and has spit close beside them, and the camotes are all spattered with the red stain?

It is a terrible thing that not even our markets can be kept clean from this bad habit of so many people. In some parts of the world the man who spit upon the sidewalk, the floor of a car, or in any public building would be arrested and taken to prison. This may seem to some a hard punishment for what many people think is a small offense. We know, however, that many diseases are caused by this practice, and the man who willfully does anything which puts his fellows in danger from disease does as great wrong as he who endangers their lives in any other way.

Many people have catarrh, bronchitis, and consumption; all such diseases can be given

to others in this way. The air can become poisoned, so that other people catch the disease. People in older countries have learned that if sick persons are careless about spitting in public places, they often endanger the lives of others; so it is quite right to compel all to stop this bad habit and to punish them if they continue in it.

Constant spitting is a bad habit in other ways. The saliva is meant to help digest the food. If one gets into the senseless habit of spitting all the time, the saliva is wasted and the digestion hurt. Then, too, it is an uncleanly habit. It makes floors and sidewalks filthy, and people who have been well brought up always have a feeling of disgust when they see any one spit in public places. If one must spit, he should do so in private, where no one need be disgusted by his act. Certainly no one who has regard for decency would ever spit upon the floor of a market.

We should make sure that all vegetables which we buy are fresh and in good condition.

Food the least bit decayed should never be eaten. It is very dangerous in this climate, where people are more likely than in colder countries to have trouble of the stomach and bowels. Not even cooking will make decayed vegetables fit to eat. The poison in them irritates the lining of the food canal and makes us sick. Besides, there is very little nourishment in poor vegetables; so that if they are eaten, the blood gets thin and cannot feed the body.

Now that we have fruit and salad, we will buy some camotes and gabi, and some squash, here at this stall where everything seems so clean. Some tomatoes, too, but we will not buy any of the beans to-day; they seem soft and flabby, and we may be sure that they are not fresh.

Meat? Yes, by and by; but we shall do better to get that elsewhere. It is bad for meat to lie in the open air as it does here. Meat should be killed at least twenty-four hours before it is eaten, and if it is kept so long, it must be on ice. Otherwise, it spoils

in a very few hours. Meat should never be left where flies can light on it, and you see that the meat here is covered with flies.



A MARKET AS IT SHOULD BE.

Flies are great carriers of disease, and often take germs from place to place on their feet. Some of these flies may have just left places where there is fever or cholera, or smallpox, and they can easily leave the germs of these diseases on the meat

where they next alight. So you see we should be very careful where we buy meat, and what sort we buy.

There is plenty of poultry in the market to-day, — chickens, ducks and pigeons, all alive, and dealers all anxious to sell. If we buy a chicken, we should get it home as carefully as we can, and it should be allowed to rest and get over its fright before it is killed. Then it should be killed as quietly and quickly as possible, as otherwise the meat will be feverish and bad for food. It should be killed some hours before it is needed for food, so that the flesh may cool. To kill it just before cooking, as is almost always done in this country, is a very bad custom, as flesh so killed is not wholesome.

Here are the fish stalls ; and here are the fish, most of them alive and flopping about. Fish caught in the river should not be bought unless they are alive ; fresh-water fish spoil so quickly that unless alive when bought, they are not likely to be fit for food. Deep-sea fish may be bought dead, and are

safe to eat if the gills are bright red and the scales clean and shiny. If the gills look dull and bluish, we should never think of buying the fish ; for it has been out of the water too long. Crabs and other shellfish should always be bought alive, unless they are already cooked and frozen, as we see them in the cold storage house. Then they must be kept on ice until they are made ready for the table. But under the very best circumstances shellfish should be sparingly used in this country, as they are the cause of much trouble of the digestion.

We will buy some rice to-day, but we must look at it carefully first. Good rice is clean and white. It is free from mold, and there should be no musty smell about it. If it has any such smell, we will not buy it, for it is unfit for food. It ought not to be fed, even to the chickens. Moldy and dirty rice is a common cause of the disease called *beri-beri*, which is so often fatal in tropical countries.

Many people are not prudent about select-

ing and cooking their rice. They are careless and often buy musty rice, nor do they cook it long enough. They eat it half cooked, and many people like it a little burned. Prepared this way the rice is hard to digest, and is irritating to the system and to the food canal.

A grown man who is well and strong needs a certain amount of food every day, to keep him in health. The body requires water, fat, sugar, and albumen, and some mineral salts. Albumen is a substance rich in food for the body, of which it makes up a large part. The white of egg is almost pure albumen, and therefore eggs are very good for food. Milk, which is the only food very young babies should have, contains all the things which the body needs, and in just the right quantities. It has water, sugar, fat, albumen, and some mineral matter. Meat has albumen and fat, but no sugar, and fish is similar to meat in this respect.

Most of the sugar we take into the body we really eat in the form of starch, but the

saliva in the mouth turns the starch into sugar. The secretions of the liver do this also. Rice is a starchy food. It contains a great deal of starch, and before we eat it, it should be well cooked, so that it is soft enough to be acted upon by the saliva and turned into sugar; otherwise, the liver has all this work to do. Corn, potatoes, meal, bread, are all starchy foods, and we get with them nearly all of the mineral substances needed; but to most of our food we need to add a little salt.

Bananas and other fruits, when they are ripe, all have sugar, and in this country people are fortunate in having the sugar cane to eat. If one does not eat too much of this, it is pleasant and wholesome, and it is very good for the teeth; it makes them white and keeps them healthy.

Besides what he takes in with his solid food, a man should drink three pints of water a day. If he drinks tea or coffee he will get some water with these, and so will not need so much, but three pints of liquid are needed

daily to keep the body well. People in this country drink also the sap of the cocoanut tree and the water contained in the cocoanut itself. These are both good and wholesome, when fresh. But if they are not fresh, they can do much harm. Why this is we shall see in another chapter.

People who live in the tropics need less fat than those in colder countries. Away in the frozen north the Esquimaux eat great quantities of fat meat and oil, and even tallow, from which candles are made. They need much fat to keep them warm. In the tropics, on the other hand, people should eat but little fat. Lean meat is good, especially beef, but pork raised here is very unwholesome. The pigs themselves eat all manner of unclean things. They are the natural scavengers of the country, and the food which they eat makes their flesh unfit for us.

The flesh of the carabao is not so good as beef. It gives really very little nourishment, and is tough and dry. The mutton which is grown in these islands is not so good as it

might be if more pains were taken. Sheep ought to be shorn twice a year, not only for the value of the wool, but because it adds to the comfort of the sheep and makes the flesh better. Dry and salt meats are of little value here, and they spoil quickly.

The fish of the Philippine Islands are rich in albumen, which the body needs. They should always be fresh, as we have seen, and should always be eaten hot. Even cooked fish, after it has grown cold, is not good for food. It is likely to produce skin diseases and certain kinds of poisoning. Many of the shellfish cause this disease also, particularly the crabs of these islands. In fact, shellfish should all be used sparingly, as they are not easy to digest and are often the cause of diarrhoea and dysentery.

Babies and very young children ought to be fed carefully in this country. Yet frequently we see tiny babies eating fish and meat, and often raw vegetables and green fruit. The stomachs of such little children are very small and weak. Their natural food

is milk, and if we give them anything else than this, we should choose it very carefully. It should be the best that we can get, perfectly clean, and easy to digest. Not until people are more careful about these matters will the children in the islands have a fair chance to grow up to healthy manhood and womanhood.

QUESTIONS.

Why is fruit that is too ripe unfit to eat?

How do we select oranges that are fresh and good?

Why should we be careful to wash all fruit and vegetables before we eat them?

Why is spitting in public places a filthy habit?

How may it be dangerous to others?

Why should meat not hang in the open air in tropical countries?

How do flies carry disease?

Why is it injurious to eat meat that has just been killed?

Why is it not a good plan to buy dead fish?

Why are crabs and shellfish a poor sort of food?

What does good rice look like?


What kinds of rice should be avoided?

What sort of food and drink are best for the tropics?

How ought babies and young children to be fed?

CHAPTER IV.

ALL AROUND THE HOUSE.

HE English people have a saying :
“Every man’s house is his castle.” In his own house a man ought to be safe, if he is to be so anywhere, and there he ought to feel sure that his family is safe. With his strong right arm he will keep all enemies away ; will fight, if need be, for the safety of his castle. It would be a very mean man who would not do this. We should think even a child a coward who did not help to defend his home. But while we defend the front door, we must not let enemies creep in at the back. Now, the deadliest enemy of human life in the tropics is dirt. We have to fight hard against dirt of every sort. Let us see, to-day, about building a house and keeping our enemy out of it.

Every country must have its own particular kind of a house. The house suitable for a cold country would not do at all in the country where we are now. We do not need walls built so as to keep out cold and winds. We have no use for fires to fight off frost and chill. But houses in countries where the winters are cold and snowy must have thick walls; they must have carpets on the floors and heavy curtains at the windows. There must be fires in the houses, to keep people warm. If the houses were not warm, people would suffer from cold and many would die.

Nevertheless, while they do not need to be built for warmth, our houses in the tropics ought to be as carefully built as are the homes in winter lands. That they are not so built is one reason why so many little children die here, — many more than in America, for instance.

First of all, since we are to build a house, we must have a good place for it. We will not build on low land if we can help it.

Neither will we build near standing water. We see a great many houses upon land that is almost always wet, but they are very unhealthful for the people who have to live in them. If our house is to be a healthful place



AN UNHEALTHFUL STREET.

Without pavement or gutters.

for us, we must build it on firm land that is well drained. Some day the whole city of Manila, within the walls, will have to be raised several feet higher than it is at present, to get it far enough above the low, un-

healthful land it now stands on. The streets must be made wider, too, so that the sun can shine upon the house walls. The narrow streets are nearly always damp and unhealthful. Manila will never be a healthy place until these things are done.

But outside of the walls, and in the country, we can pick our plots and prepare our building sites. The fine, beautiful house and the little nipa cottage can be equal in one respect; that is, both can have clean, healthful surroundings.

The living-rooms of houses in this country should never be close to the ground. The land on which a house stands should be well drained and kept dry. This, however, is not all that should be done to prepare a building spot. In tropical countries bad gases rise from the earth at night, and we should do what we can to prevent these from getting into the house. The ground where the house is to stand should be dug down at least a foot and filled in with hard cement. This will keep it dry and prevent

the earth-gases from rising through the floors. Besides this foundation, the house should have cement gutters running all around it, to carry off surface water. The foundation walls should rise from the cement bottom to a height of at least six feet.

The ground floor may be used as a place to store carriages, furniture, and other things of that sort; but it is unsafe to keep horses or other animals there. All the bad odors and gases from these rise, making the living rooms above unhealthful.

The first floor of our house,—the floor on which we mean to live, should be tightly built, so as to keep out all drafts of air, and to leave as few cracks as possible for insects to crawl through. We shall get fresh air enough if we have large windows that open freely.

We are fortunate, in this country, in having the beautiful thin shells with which our window sashes are filled. These are much better here than glass would be. They shut

out the bright rays of the sun, while they can be pierced with tiny holes, if need be, to let in air when the window is closed. Heavy shutters with slats are also good. If we have these in the house, the windows may be open, even at night, or when it rains.

The roof of our house is a very important part. Most of the roofs in this country are of nipa or bamboo. These make a good protection against the sun's rays, but they need great care, and should be often renewed, as the wind tears them so that they become leaky. They catch and hold the dust, and are always hatching-places for all sorts of insects. The roof of split bamboo is cheap, beautiful, and easy to make, but it is also easily blown away by a high wind. If we use it, we must fasten it with wire to the rafters and walls.

Wood makes a very bad roofing material. It decays quickly and is a poor protection against the rain. Then, too, it can hardly be built so that a great wind will not blow it away. Many roofs are now built of zinc, and

for some reasons this is good material to make them of. If we have a zinc roof, however, we must build a garret between it and the living rooms,—a sort of air chamber for the sake of coolness; for when the sun beats down on the zinc roof, the metal gets very hot. This sort of roof is useful for catching rain water; after the first rain has washed off all the dust and dirt, then we may collect the rain water that falls from the roof into our cisterns, and have a plentiful, pure supply during the rainy season.

In early days roofs were covered with half-round red tiles. We see a great many of them still on old houses, but they are heavy, and dangerous as well during the typhoons and earthquakes that sometimes visit us.

Perhaps the best of all roofs for this climate are the ones covered with flat, broad pieces of slate, secured by wire or nails to boards and rafters underneath, but roofs of this sort are expensive. It will probably be best, therefore, for us to roof our house

with zinc. If we have an airy garret between it and the ceiling of the upper rooms, it will be quite cool enough.

The rooms in our house will be very simple. We shall not have any heavy, stiff carpets on the floors, to catch dust and breed disease. Nor shall there be moldings or ornamental ledges along the walls, because these also catch and hold the dust. Our rooms shall be easy to keep clean. What pictures and ornaments we have on the walls shall be such as can readily be reached and dusted. A room so decorated that it cannot be kept free from dust and dirt cannot possibly be beautiful.

The kitchen of a house anywhere should be clean as can be, but particularly in this country. It should be on the north side of the house if possible, for the sake of shade. We will not, however, have trees growing very near it, even to shade it. They have a saying in the tropics that "He who grows a tree against his house invites death to his door." This means that dampness and shade

made by the trees growing too near the house breed disease and often bring death. So we shall have no trees nearer our house than twenty feet.

Nor shall any one be allowed to sleep in our kitchen. It is a very unhealthful and uncleanly custom to let the servants sleep in the kitchen. There should be no sleeping in a room where food is prepared. By morning the air of a sleeping room is always charged with bad matter given off from the lungs of the sleepers. Sleeping rooms have a chance for ventilation during the day, and all these vapors are replaced by pure air. But there is no time in the morning to change the air of the kitchen. The food must be prepared in the midst of all the bad gases that have gathered there during the night.

This brings us to think of what proper sleeping arrangements should be. Not enough attention is given to the subject in this country. The nights are so hot that people are careless. Many grown people

and nearly all children sleep on or close to the floor. This custom is a great source of sickness. If the floor is of bamboo, the bad air from the earth rises through it at night. There is always a draft across the floor, from doors and from windows, and from spaces in the floor itself. When we are asleep the body is relaxed, the pores of the skin are open, and we are in every way less able to resist chills and the bad effects of impure air. Sleep is a condition of helplessness, and we should protect ourselves in it.

A serious cause of disease, which people are just beginning to understand, is the mosquito. We have only lately come to know that this insect is the direct cause of the malaria which is so common, and so dangerous, here. Malaria is a germ disease. That is, it is a disease caused by germs which get into the blood. The germ of malaria is a parasite which lives on the body of the mosquito. We can imagine how tiny it must be when we know that a great many of them find room to live on a single mosquito.

Now, when the mosquito lights on a person and bites him, these germs often get into the little puncture which the insect makes to draw blood. In this way they get into the blood of the human being, and there they increase in numbers very fast. They poison the blood, the person becomes sick and weak, suffers from headache and other pains, and very often dies at last of malaria.

We may learn from these facts how important it is that mosquito nets should be used in this country. Even if a person sleeps upon the floor, he should arrange some sort of protection from the mosquitoes.

Every morning, the floors of our house must be washed with water in which we have put a little kerosene oil; one or two large spoonfuls of oil will be enough for a bucket of water. We should see that the washing is carefully done. This washing with kerosene will help to keep mosquitoes away. It also tends to drive out ants and other small insects. Kerosene oil is cleansing, and helps to kill many of the germs

that breed in corners and cracks. If it is poured upon standing water, it will prevent mosquitoes from breeding there. One ounce of kerosene will spread out over fifteen square feet of water, and this fact is made use of in some countries in getting rid of mosquitoes. It may be spread over the surface of the water in cisterns without imparting any taste to the water which is drawn from below for drinking purposes.

Persons who have consumption ought never to sleep in the same room with others, particularly with children. Consumption is catching. The germs which cause it are breathed out by the victim, and other people often inhale them and contract the disease. A consumptive person should never spit on the floor, and all discharges from the mouth should be disinfected.

There are two other places about a house in the tropics where our arch enemy, dirt, may hide and slay us, if we are not on guard against it. These are the sinks and the cesspools, which receive waste from the

bathroom, toilet, and such places. No refuse matter ought to be thrown out about the house, and no dirt should be allowed to gather on the ground floor or in the court. We cannot be too careful about this; for if dirt does gather in these places, it is sure to breed disease.

Decayed vegetables, fruit, and all leavings from the kitchen should be carried away and burned, or buried, or otherwise disposed of where they can do no harm. Even the water in which dishes are washed, or in which we have bathed, should not be poured out on the ground near the house. It should be carried as far away as possible and emptied in some waste place.

There are few sewers in this country. Even those in Manila are scarcely worthy of the name. Before long, steps will have to be taken to have them in all cities in the archipelago; for there is great need for them. The fact that there are no good sewers makes the question of cleanliness about the house a grave one. If waste from the toilets is

carried into the cesspools, there should be plenty of running water with it for flushing; it should be carried in pipes to the cesspool, and at least once a day the water-closet should be flushed with water in which there is some good disinfectant. If, as is so often the case, the closet is merely an outhouse over a hole or vault dug in the earth, at least five liters of a mixture of quicklime and dry earth should be put into the vault every day.

Milk of lime is one of the best disinfectants for use in this country. It is cheap, and it not only disinfects waste matter, but destroys bad odors. It is powdered quicklime dissolved in water, about one liter of quicklime to four liters of water. Another very cheap, but reliable, disinfectant is made by dissolving three drams of mercury bichloride with three drams of ammonium chloride in a bucket of water. This mixture can always be kept in the house and a tabo or two of it thrown down the closet seat whenever the latter is used. It must be kept where little children cannot meddle with it; but a child

need not be very old to be wise enough to use it when necessary and not to meddle with it. Children, as well as grown people, should feel in honor bound to take good care of the house and to fight against dirt and disease when these attack it.

The bathroom and water-closet of our house should be kept as clean as can be. They should be swept and washed every day, and no soiled clothing or towels should be allowed to lie about. Our enemies, the mosquitoes, are very fond of hiding about soiled clothing or that which has been worn and is not soiled enough to be sent to the laundry.

Soiled garments should be washed as soon as possible after they are taken off. Right here lurks one of the greatest foes to health in this country. People are too careless about the way their garments are washed. The clothes often lie for several days in baskets or bags before going to the laundry or being washed. This is bad, as germs breed quickly among them. It is harmful

for clothes to be washed in pools or canals. The water of standing pools or even of the canals in the city is, more often than not, full of disease germs.

To make matters worse, the clothes, when washed, are laid out on the grass to dry. All sorts of tiny creeping things are here; so



CLOTHES DRYING ON THE GROUND.

that while the garments look white and clean, they may be full of wriggling life from the water and from the ground,—creatures too small to be seen without a microscope, yet the cause, many times, of the unpleasant skin diseases so common in this climate.

The laundry work of the family ought to be done at home, and the clothes should be

hung upon lines to dry. In other countries clothes are boiled after first being washed with soap, but this is not possible here; probably it never will be possible. Yet clothes can be washed with soap and water and then leached,—that is, rinsed in lye



THE BEST WAY TO DRY CLOTHES.

water. Wood ashes are easy to get, and lye water—that is, water in which the ashes have been soaked—will destroy all germs. The clothes rinsed in it are as safe as those which have been boiled.

Attention to all of these things means

work for men and women, and for the boys and girls who wish to feel that their house is really their castle which they are defending against unseen foes. These foes are harder to fight than those who come openly and slay with the sword. They are more dangerous foes, moreover; for they are about us always, and must be fought daily. Otherwise, they will rob us of health, of comfort, of sight; they will make us the victims of disease which is ugly to look upon and painful to bear. They even take from us life itself, unless we are constantly on guard to fight their great helper, the dirt, which gathers about any neglected spot.

QUESTIONS.

What sort of site should be chosen to build a home upon?

How should the foundation be prepared?

Why is it unhealthful to live near the ground in the tropics?

Why is it unwise to keep animals under the houses?

What is the best sort of roof in this country?

How should the kitchen be located?

Why should no one be allowed to sleep in the kitchen?

Why is it not healthful to sleep on the floor?

How should the body be protected during sleep?

How do mosquitoes cause malaria?

How does the use of kerosene oil keep them away?

Why should consumptives never sleep in the room with healthy persons?

How should refuse matter be disposed of?

What are some of the best cheap disinfectants?

How should clothes be washed?

How should they be dried?

CHAPTER V.

OUR OWN SELVES.



HUMAN being is very wonderful. Even the smallest baby is entirely separate from all the rest of the world. He is a part of the great whole, but he has his own life and separate being, just as much as the greatest man in the world. If everybody in the world did just what was right excepting one man, both that man and the rest of the world would suffer because of his doing wrong. If all the rest of the world were healthy and clean and he was not, the cleanliness and health of all the others would not save him from being dirty and unhealthy. Each one of us must do all that he can to help the rest of the world to be good and healthy and clean. Now, the first and greatest thing that any one of us

can do toward this, is to do right and be healthy and clean himself.

The human being is not only very wonderful, but he lives in a wonderful body. This body can do much and endure much. It is very perfectly adapted to its use. If man had not his reason to help him; if he did not walk upright when all other creatures crawl or go on all fours; if he did not differ from the lower animals in any other way than by having a thumb on each hand, he would still be superior to them. All the other large creatures are stronger than man, but his skillful hands, with their thumbs, make him master of them. These help him to grasp and to hold, to make things for his own use. He makes clothing to wear, houses to shelter himself, and weapons with which to defend himself.

Hundreds of years ago there lived a great doctor, named Galen. He wrote one of the first books ever written about the human body, and he has left it on record that he was obliged to believe that God lives; for none

but divine power could have made so wonderful a thing as the joint that turns the human hand at the wrist. Yet this joint is only one of the many wonderful things in the body.

Now, to each of us is intrusted one of these bodies to take care of, that it may do our work for us. Our work is not just to live for ourselves, but to do something useful in the world; to help it all to be better because we are here. So you see how very much worth while it is that we should keep these useful bodies of ours as well and strong as we can.

Besides the outer garments in which we clothe it, the body has a garment of its own. This garment is never laid aside; and though it is in constant use, it never wears out. We call it the *skin*. The skin is meant to protect the body. Lying close under it are many nerve ends, delicate blood vessels, oil glands, sweat glands, and other tiny organs that are too small to be seen without a microscope, but which are needed to keep the

body in good order. In the pictures which are shown on this page, you will see how

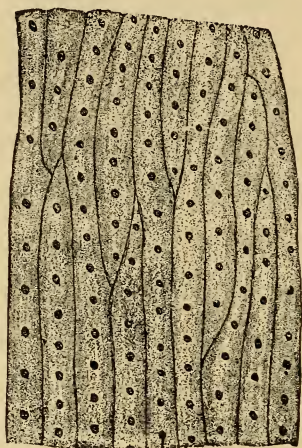


Fig. 1.

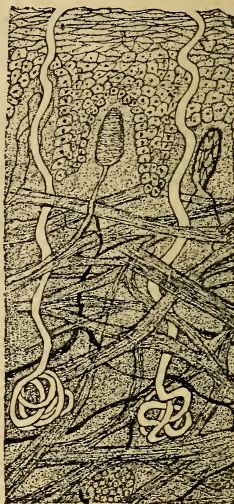


Fig. 2.

THE SKIN MAGNIFIED.

Fig. 1. Surface showing openings of pores.

Fig. 2. Side view of sweat glands and pores.

these tiny organs look when they are many times magnified.

Now, like our outer clothing, this garment of the body needs to be kept very clean. You know that in this country when we take exercise, or, during the heat of the day, even without our taking exercise, the surface

of the skin gets moist, little drops of water stand on it, and even run down our faces or make our hands wet. We call this moisture *perspiration*, and say that we are *sweating* or *perspiring* with the heat. The drops of water come from openings in the skin, which we call *pores*. These are little tubes connecting with sweat glands below the skin. You will see in the picture how these sweat glands look, and how the pores come to the surface.

The perspiration is not pure, clean water; it contains many impurities which the lungs, kidneys, and other organs have not cast out from the body. It is the work of the skin to help carry off these impurities, and it does this by means of sweat glands and pores. If the perspiration dries on the skin, the impurities remain; they stop up the pores and make the body unhealthy. It is to prevent all this that we bathe often. Bathing keeps the pores of the skin open and the skin itself in a healthy condition. We use soap because the skin secretes oil as well as

perspiration. This oil is to keep it soft and smooth, but it is needful that the excess of it should be washed off with soap, in order that the oil glands may not become clogged.

We should be very careful not to become chilled when in a perspiration. We should not plunge into cold water at this time. Neglect of this rule often causes bowel trouble, and is a great cause of the catarrh and bronchitis so common among the Filipino people. To keep it perfectly clean, the body should be washed with soap once a day. Just before noon is the best time to bathe, or else about four o'clock in the afternoon. One should never bathe right after eating. If one takes a sponge bath with water alone, immediately on rising, one feels better all day, but, in this climate, the bath with soap is needed as well. Babies and very little children should be bathed with soap and water without being plunged into the bath. They are delicate, and unable to withstand the chill that might result. Chills are very dangerous, and a person should

be careful in the rainy season not to get drenched.

A person who has any kind of skin trouble should be very careful not to give it to any one else. He owes it to all others to take pains about this. If he does not, he is not a good citizen. He should be careful not to use the towels that any one else is likely to use, and his soiled clothing, when taken off, should be disinfected before being sent to the laundry.

The custom of going barefoot is a dangerous one. The sole of the foot is a very delicate surface ; a great many nerves and blood vessels center in the instep, and any injury to these may produce the disease called *lockjaw*, which usually results fatally. Even if nothing so serious as this happens, the foot is often injured by bruising or by other hurts. The feet are susceptible to chill, especially in the rainy season, when they should be kept dry and warm. Disease is often taken through the feet, especially such diseases as the bubonic plague, and the dif-

ferent kinds of itch which are known in the tropics. Aside from all these reasons why we should dress the feet, it is an untidy practice to go barefoot. The low shoes without fastenings, into which so many Filipinos thrust their feet, give people who wear them an awkward, shuffling walk. A shoe which fits the foot well and is fastened upon it so that it does not flap at the heel is the only one that should be worn out-of-doors, and no shoes should be worn without stockings.

Every boy or girl who wants to be well must take exercise. If we do not use our muscles, they become weak and small. The brain suffers as well. When we exercise we not only strengthen our muscles, but we set the blood in quicker circulation. The heart must work faster; the lungs must expand more; the food digests better and the brain is clearer. The best sort of exercise is useful work out-of-doors or about the house, but boys and girls need to play as well as work. All games that take them out-of-doors and

make them move about actively are good for them.

Many Filipino boys and girls do one thing that is very hurtful; that is, they smoke. The use of tobacco injures growing young people. It stunts the growth, so that even when grown they are small and weak. Boys who smoke do not grow so fast or so large as those who do not. Smoking injures the memory and makes people heavy and stupid; it makes them less inclined to take exercise, and so the muscles become weak; it hurts the digestion and makes the stomach weak. Besides these things, it induces the constant spitting so common in this country; and we have seen how hurtful this waste of the saliva is.

Chewing betel nut is even worse than smoking. If all of the betel juice is not spit out, some of it will be swallowed, and this is very bad indeed, as the betel acts like a poison on the system. So the betel chewer must waste all the saliva that comes into his mouth while he is chewing the nut. More

than this, he stains the sidewalks and floors with the filthy stuff, and makes himself ugly to look at, as well as offensive to cleanliness. It is to be hoped that the boys and girls who study this book will never take up such a disgusting habit.

Still another thing which is very bad for the health in this country is the use of alcohol. Alcohol is bad for the system; it irritates the delicate lining of the food canal, and hurts the liver and the kidneys.

We have said that tuba, the juice from the cocoanut tree, is good and refreshing to drink when just drawn from the tree; but in a few hours after it is drawn changes begin to take place in it. The greatest of these changes we call *fermentation*; it is caused by tiny vegetable growths, called *ferments*. These are too small to be seen unless magnified, but they float about in the air. They get into the tuba, and, because there is something there which they like and thrive upon, they grow and increase in numbers very fast. They separate the sugar of the tuba into the

parts that make up sugar, and take from it the part which they like. What is left forms two other things. One is a poisonous gas, called *carbonic acid* gas.

At one stage in the fermenting process, there is a great deal of this carbonic acid gas in the tuba, and that is what gives it its dreadful taste when it first begins to *work* or *ferment*. The other thing found in the tuba is alcohol. If this were not distilled, the tuba would simply go on working until all the sugar was gone; then it would be as sour as vinegar and disagreeable to drink. But distillers heat it until it boils; the alcohol rises and passes off into a vessel especially prepared to receive it, and becomes the drink called *bino*. This drink is really an active poison to most people. If a man drinks much of it he becomes crazy, his actions are dangerous to society, and at last he has to be kept in confinement. Often he does terrible mischief under the influence of *bino*.

It is very fortunate for this country that Filipinos know how dangerous it is to drink

this stuff. Still, there are some weak and foolish people who think that they can stand it, and who drink it until they form a habit which holds them in bondage.

None of the alcohol made in this country is refined; therefore it is full of impurities and very poisonous. Those who know the climate agree that the less alcohol of any sort one uses here, the better. Those soldiers and others who let it quite alone are the ones who best withstand the bad effects of the tropics and keep well and strong. Alcohol weakens the brain sooner than it does any other part of the body. A person cannot think clearly when he has had too much; he cannot walk straight, and often a man does things under its influence which he never would do if he had not been drinking it.

There are five different ways in which a person can tell something of what is going on around him. He can see, he can hear, smell, or touch some things, and some he can also taste. We call these five faculties

of man the *special senses*. Each of these special senses has its own home in the body, its own organ to do its work. For instance, the eyes see, the ears hear, the organs of taste are in the mouth, those of the smell in the nose, while the sense of touch is everywhere in the body where there are any nerves.

In this country the organs of the special senses need great care. There are a great many blind people here, who have become blind because they have not understood how to take care of the eyes. The lids and the eyelashes are meant to protect the eyes and keep out dust, to prevent insects, etc., from getting into them.

Nature has taken wonderful pains to protect our eyes, but we must do all we can to help her. She has prepared a fluid which washes the balls, but the outside of the eyes as well should be carefully washed once or twice a day, and wiped dry. We should be very particular to wipe them on a clean cloth. We should never use a towel that is

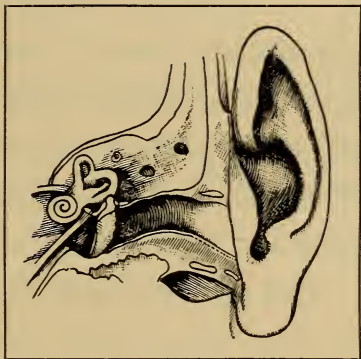
used by any one who has any trouble with the eyes or who has any skin disease. The eyes should never be rubbed with the fingers. When any foreign matters, as specks of dust, or cinders, get into them, we should go at once to some skillful physician to have them removed. We should shade the eyes from the direct rays of the sun. If we walk out in the middle of the day, we should carry an umbrella or wear a broad hat. We should not strain the eyes, or use them when they are tired or when the light is bad.

Alcohol is very bad for the eyes; it makes them weak. The eyes of a hard drinker become red and watery. Such a person may often become blind. Tobacco, too, causes dimness of sight, and has been known to produce blindness.

Strange as it may seem, the ears are even more delicate than the eyes, and more readily injured; and when hurt, there is less that science can do for them. The outer ear only catches sound and turns it inward. The parts of the ear that really hear are deep in

the head, where they can be well protected. The little canal leading into the ear secretes wax, which hinders insects from crawling in. Sometimes they do get in, despite the wax. In some parts of this country, there are leeches that get into the ear. When they do this they cause great pain and often produce deafness. We should never try to pick or lift anything of this sort out of the ear. The best way, when anything alive gets into the ear, is to pour in a little quantity of oil. This nearly always causes the creature which has gotten in to back out, in order to escape the oil. If, instead of coming out, it is drowned, it must be removed by some skillful physician.

Nothing should ever be inserted in the ear for the purpose of cleaning it except the little finger. The ear should be washed



THE EAR.

Showing the drum and bones.

very carefully with soap and water and dried thoroughly. Sometimes, when swimming, people get water into their ears. They should shake it out at once, or the ears may ache. Sometimes water that gets in this way causes inflammation and cold, which hurt the sense of hearing. No one should ever strike another on the ear, even in play. It is likely to cause deafness. What is called the *drum* of the ear is a very delicate membrane which receives the sound. This is what really hears, and a blow on the side of the head may rupture this membrane and destroy the hearing.

The sense of smell is high up in the nose. It is a very useful sense and warns us of danger. We can often detect bad air by its odor. We know whether food is good or whether it is spoiled, by its smell.

We taste things with the tongue. Substances which do not dissolve in water have no taste. Even our food would have no taste if it were dry. The saliva must dissolve it before we can taste it. We can hurt the

sense of taste by eating too fast, or by seasoning our food too strongly with pepper and other hot spices. Chewing the betel nut helps to destroy the sense of taste, and so does much use of alcohol. We need the sense of taste to tell us whether food is good or bad. Food which has a pleasant taste is more easily digested than that which we do not like.

The sense of touch tells us whether things are hard or soft; it tells us when we are hurt. It does this by the feeling which we call pain. If we did not feel pain when we were being injured, we might be killed before we could know of our danger and protect ourselves from it.

So we see how true it is that our bodies are wonderful machines. But they are something besides machines,—they are houses in which the soul dwells, and as such they are worthy of great care and honor. We must keep them clean. It is our duty to feed them right and guard them from injury. We should be careful, too, never to injure

them ourselves by putting them to uses not clean and pure, or by making them accustomed to things which are bad for them. When we do any of these things, we hurt the soul, as well as the body, and bring shame upon ourselves and sorrow to others.

QUESTIONS.

Why should we try to keep our bodies well and strong?

What is perspiration?

Why should we bathe often?

How should children be bathed?

When is the best time to bathe?

Why is it imprudent to go barefoot in the tropics?

Is smoking hurtful to boys and girls?

What does it do?

Why is betel chewing injurious?

How does alcohol affect those who drink it to excess?

What is its effect on the mind? On the eyes?

How do we tell what is going on about us?

What are the organs of the five senses?

How can we best take care of our eyes? Of our ears?

What tells us when we are hurt?

What is our duty toward our bodies?

CHAPTER VI.

PUBLIC HYGIENE.



ONE of the great questions in which governments in all countries are interested is how to keep down the death rate in great cities. In olden times there were many plagues and epidemics. These often destroyed thousands of lives. People did not understand why the plagues came; they used to think them punishments for sin, or sent by some evil spirit out of hatred to humanity. They did not know how to meet them or how to take care of those whom the plagues attacked, and so whole cities were sometimes emptied by disease before which the science of those days was helpless.

But now we have come to know that all epidemics have natural causes. An epidemic is always caused either by bad water or

neglected sewers or poisonous gases arising from long-gathered filth. In Europe and in America every city has its system or systems of sewers, its boards of public health and of street cleaning. Great care is taken, and enormous sums of money are spent, to keep the cities clean, that the people may be as healthy as possible.

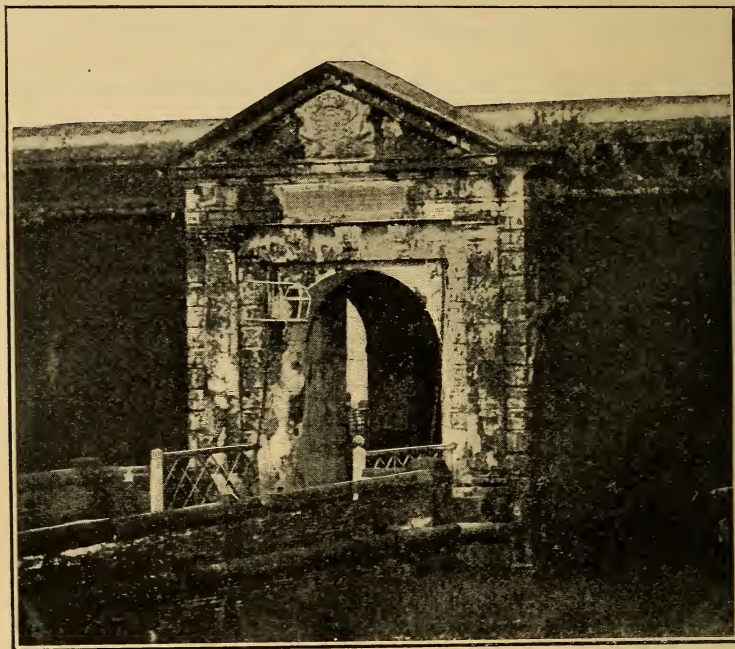
Manila, the capital city of the Philippines, is one of the largest cities on the Asiatic coast. It has been, in the past, in very bad condition because of filth. One of the first things the Americans began to do when they came here was to try to make the city clean, so that it would be more healthful. This was a very difficult thing to do, because of the dirt which had been allowed to gather during many years. It was also difficult because of the way in which the city of Manila is built. The ground is low and marshy. Two feet below the surface of the earth under the city, water is found almost everywhere. This keeps the earth damp. Those who built houses in the past knew

this, so they laid cement floors in the basements of their buildings.

But the cement floors were not made as they should have been. Instead of digging down into the earth and filling in the excavation, builders spread the cement on the surface of the ground and then built their walls around this platform. The cement which has been used here is not the best for such a country as this. It is what is called Roman cement, very porous, and not hard and solid, as is the Portland cement in use in America. The walls of the houses, as well as the ground floors, were very often of this cement.

If you take a lamp wick and hold one end of it in oil, before long not only that end but the whole wick is wet with the oil. This is because the porous fibers of the wick have soaked up the oil. Now, these porous walls of the houses in Manila take up the moisture from the earth, so that many of them are completely soaked with water. When this is the case, mold begins to grow on the walls.

It is not unusual to see walls quite overgrown with green mold and moss that always feels a little damp to the touch.



GATE COVERED WITH UNHEALTHFUL MOLD.

This growth on the walls is a great hurt to the health of people living in the houses. It breeds disease, and keeps the moisture in the walls, so that the houses are damp and unwholesome. It is of no use to shut our

windows at night, for the early morning chill that we hope thus to shut out is in the walls themselves. It is far better to leave the windows open, that fresh air may come in and drive out some of the poisonous vapors that rise from the walls and creep into the house. The walls of the house should be kept clean of mold. They should be scraped and whitewashed very often, and the green, unhealthy growth kept down.

In the cities of Europe and America there are great sewer systems to take the waste and refuse from the houses and carry it far from the city. The sewers empty into the sea or into drainage canals, and thence to points where the sewage can be destroyed so that it will not endanger life. The city of Manila has some sewers. We can see the openings into them in the streets. They are small, square openings, covered with stone. But the sewers that run through the streets empty into the open moat that surrounds the walled city! It will become necessary, before many years, to fill this

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moat, to save the people of Manila from being killed by the gases that rise from it.

Damp walls, damp floors, damp rooms close to the ground, make the very best sort of places for dirt to gather. It is not enough that walls should be scraped and floors cleaned once in a while; they must be kept clean all the time. This is why sanitary inspectors go about the city to examine houses and walls and report on their condition. We should be glad that they do this; for we know that if they are faithful about it, the city will be more healthful and many lives will be saved.

The dirt that gathers in the streets is of many sorts. A great deal is made by the horses and carabaos, mules and oxen, that draw loads about the city. The wheels of the vehicles, too, grind the stone pavement to dust, and this is blown about by the wind. Dead leaves drop from the trees, choke up the gutters, and, left to themselves, will make sodden masses of decayed vegetation in corners. Waste paper blows about, and

all sorts of unclean things are thrown into the streets by careless people. It takes a small army of laborers to keep the streets in order. They go over the city with brooms, shovels, and dust-boxes, and sweep and gather up refuse and dirt. They put it into carts and take it away to where it is loaded upon barges and sent out to sea, or used to fill in low places where it can do no harm.

There is a great deal that each of us can do to help keep the streets clean. No one should ever do anything that is likely to leave any dirt about them. Banana and orange peel should never be thrown on the sidewalk. This is not only a dirty and untidy trick, but often a bit of peel does serious mischief; a person may step upon one, slip, and get a very dangerous fall.

School children are the very best sort of helpers to the street-cleaning department. They can form what are called "Good-Government" clubs or societies, to help. They can keep a sharp lookout for careless people who are about to throw paper or fruit

parings into the street. When they see any one doing this, they should not be afraid to remind him that it is a dangerous and an untidy thing to do. Most great cities now provide sheet-iron boxes along the sidewalks to receive all these things. We should have them in Manila. The children could then point them out to any one who needed to have his attention called to them. If they saw paper or peelings lying about, the boys might pick them up, if no street-cleaner were near, and put them into the boxes. We may be sure that girls and boys who were thus careful, never would do anything themselves to make the city untidy. They would not throw paper and peelings about, nor spit upon the sidewalks. Even school children ought to remember that they are growing up to be citizens. They cannot begin too young to take pride in their city or town or village and try to make it one of the best-governed places in the country. They should take pride in keeping school buildings nice. Even if these buildings are old, as so many are, at present,

in the islands, they can still be kept so clean that any one entering will know that the pupils are self-governing, order-loving boys and girls, who will some day be self-governing and order-loving citizens.

The elements of good living are, after all, very simple. If we would live long and keep our bodies in condition to do their work, we must be clean. We must have clean surroundings; we must drink pure water and eat clean, wholesome food. We must not eat or drink things that will hurt us. We must do nothing that will make our bodies less fit dwelling-places for our souls. We must be honest and kind, ready to help and to take part in keeping everything about us clean and well ordered. Thus we shall be useful citizens, each ready to do his own part to make this world the place it should be.

QUESTIONS.

What are the causes of epidemics?

Why are damp walls and floors unhealthful?

Is it best, in this country, to sleep with our windows closed?

Where should sewers empty ?

Why is the sewer system of Manila a bad one ?

What sort of dirt gathers in the streets ?

How can school children help to keep the city clean ?

What should we all try to do if we would live long ?

Why is it our duty to do these things ?

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